Overview of National Programmes: HSI - The Canadian Perspective

National Defence HQ, Dir. S&T - Human Perf. 3, Ottawa ON
Options Inc., Snr Partner, HSI Consultants, Waterloo ON
DCIEM, Head/HF Command Systems, Toronto ON
Canada

National Defence / Défense nationale

Canada

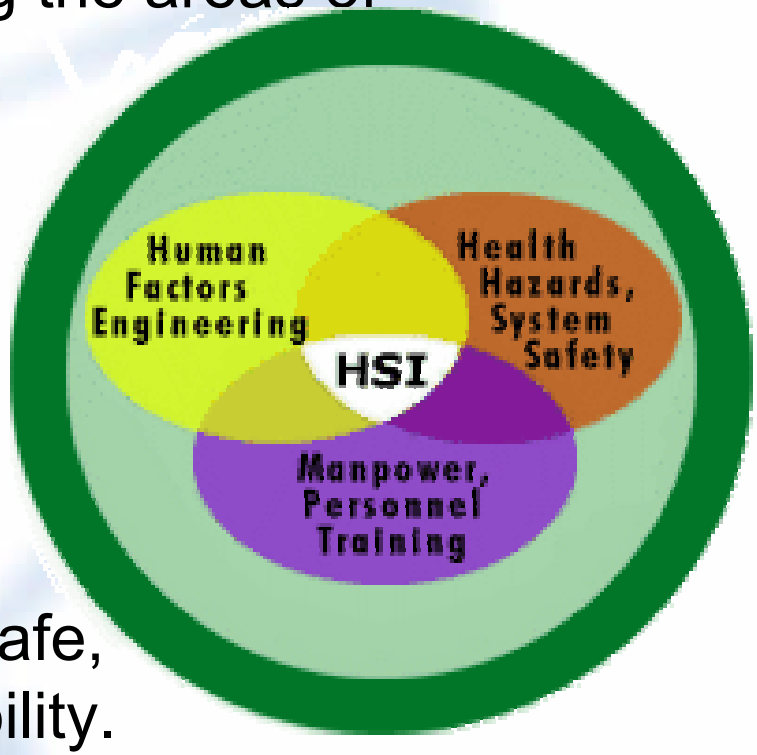
OUTLINE

- Human Systems Integration Defined
- HSI Rational
- HSI Project Overview
  - People
  - Process
  - Tools
- Future

HSI - DEFINITION

Human System Integration (HSI) is:

- the technical process of integrating the areas of
  - Human Factors Engn
  - Manpower & Pers.
  - Training,
  - Systems Safety, and
  - Health Hazards



- with a materiel system to ensure safe, effective operability and supportability.

HSI Concept Developement: Rationale

- Pressure and support from DND projects
- Lessons learned from previous projects
- Lessons learned from industry
- Technological requirements (SOR)
- Technological opportunity (HSI Tools)
- International cooperation and interoperability

HSI Concept: Constraints

- Minimal Resources
- Life Cycle Cost Impact, or lack thereof...
- Current Business Culture (M&S, SMART, SBA, RMA)
- Linked Efforts (dispersed responsibilities in DND)
- Depth of HSI Skill Base in CA, or lack thereof...

HSI Concept: Overview

- Mission: "The pursuit of optimal health, safety, human factors engineering and human performance through the application of HSI principles in Military systems involving the human element".
- Represented by Logo
- HSI Capability Components
  - People
  - Process
  - Tools

HSI Concept: People

- Personnel within HSI capability:
  - HSI Coordinators
  - HSI Steering Board
  - HSI Industrial Base

- Three methods of interacting:
  - Project Conducts Own Analysis
  - Project Obtains Own Contractors
  - Project Comes to HSI Team for Support

HSI Concept: Process

- HSI Process, now developed in draft form
- Links the HSI domains within the MA&S process
- Must be in accordance with the DMS

HSI Concept: Tools

- Communication
- Analysis (HSI Tools)
- Demonstrations (Tech Demo as ACTD)
- Libraries

HSI People Interviews

Individual or Group	Contact Made? Y	N	Current Status or Further Action
DMSS 2-6	•		
DLR DLR Prog	•	•	Spoke with DLR 3 personnel who responded on behalf of DLR Prog. DLR will have a new M.Sc. trained Human Factors resource in September 2000 who will the DLR point of contact for HSI.
DAR DAR Prog 3		•	Air staff would like a written meeting request with summary of aim sent to DAR, DAR Prog, DSAA, SGAFD, MPD, DAR Prog 3 and DAR Prog 2 so that they can respond as a group.
DTA 3-6	•		DTA may require letter asking permission for DTA 3-6 to participate in any formal meetings.
DSSPM DSSPM 2	•		
DSTHP DSTHP 2	•		
DNPR		•	
DLP	•		
D Air PG&T		•	
DRET	•		Spoke with DRET staff on the phone, reviewed capability descriptions and mandate of DRET 3.
DHRRE	•		
DMHRRE	•	•	Some phone discussions, but must still meet with human resource modeling analysts to discuss their techniques. Clearly DMHRRE asked by DRET community to perform manpower and personnel assessments as required.
DMPPD DMPPD 2-3		•	
DGNS		•	
DMH Svcs	•		Suggests that HSI project also talk with DMEDPol (Occupational Medicine and Preventative Medicine)
CLS Med Adv.		•	
D Air PM&S 4		•	
COS J3/Doc & Trg	•		
CFMGHQ/ACOS Ops CFMGHQ/ACOS Hlth Services		•	Major D. Van Loon appointed as contact. Some phone discussion, still must meet.
D Safe G		•	
DFS		•	
DFPPC 2 DFPPC 7-2	•	•	Spoke with DFPPC 2, still must get a meeting with DFPPC 7-2.
DBCM 2-8	•		Systems Engineering - must have continual meetings.
DBCM 2-4	•		ILS and LCC - must have continual meetings.
DCIEM OHE	•		

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HSI People - Interviews

- The people are there
- The people are interested
- They need hard products to focus on:
  - Web site
  - Process
  - Team structure

- Re-visit key groups with new process soon

HSI People - Virtual Team

- HSI Coordinators - coordinate
- HSI Steering Board - steers
  - DBCM - authority for processes
  - DFPPC - authority for project life cycle and analyses required for decision documents
  - HSI Steering board advises DBCM and DFPPC, reps from which also sit on the board
- Interested DND Personnel, HSI Industrial Base
  - stay current through communications

HSI PROGRAM - PEOPLE

HSI Steering BOARD

VIRTUAL
HSI Support Team
- Co-ordination Staff
- Future Permanent Staff
- Contractor Support

Joint HSI Rep

Industry HSI Rep

Land HSI Rep

Air HSI Rep

Maritime HSI Rep

OGD/ Domain HSI Rep

Allies HSI Rep

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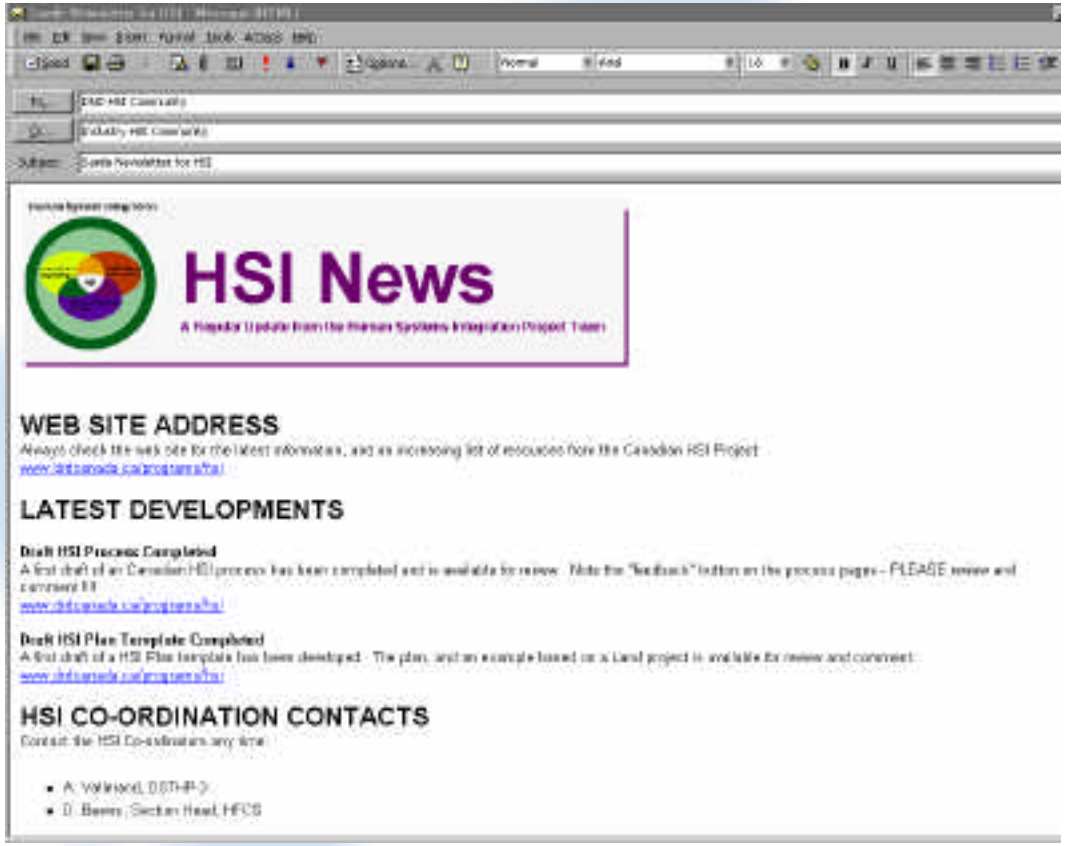
HSI People - Contact Database

- DND Database
- Industry Database

- Register On-line
  - DND through DIN
  - Industry through WWW or Fax, called through MERX

HSI People - Communications

- HSI Web Site(s)
- HSI *e-Newsletter*
  - e-mail to group to remind to submit articles
  - Doubleclick to Web page
  - enter three line max article
  - newsletter automatically assembled and sent to list after due date



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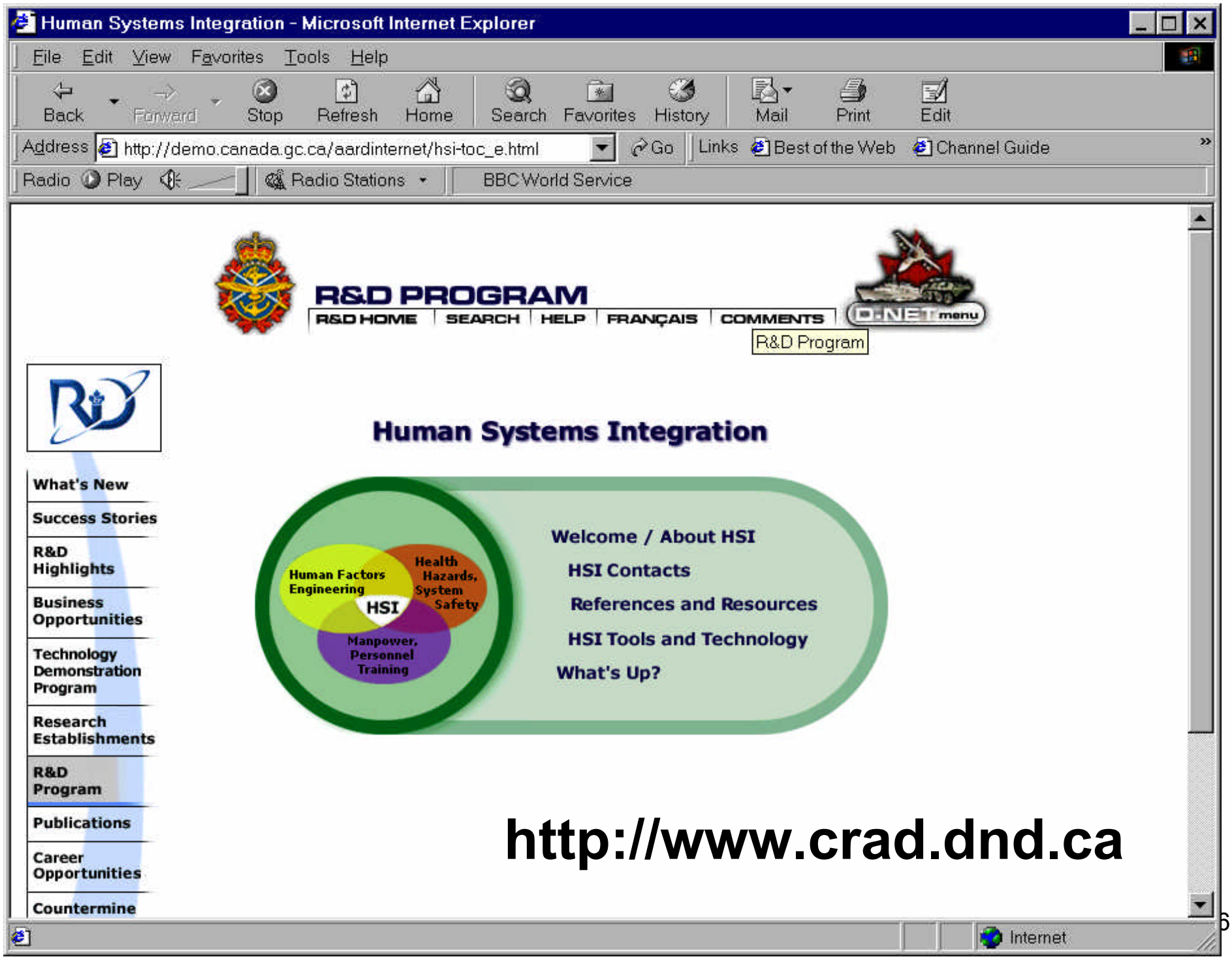
Human Systems Integration - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History Mail Print Edit
Address http://demo.canada.gc.ca/aardinternet/hsi-toc_e.html
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Countermine
Human Factors Engineering
Health Hazards, System Safety
HSI
Manpower, Personnel Training
Welcome / About HSI
HSI Contacts
References and Resources
HSI Tools and Technology
What's Up?
http://www.crad.dnd.ca
Internet

Human Systems Integration - Microsoft Internet Explorer

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Address http://www.crad.dnd.ca/hsi/whatis_e.html Go Links Best of the Web Channel Guide

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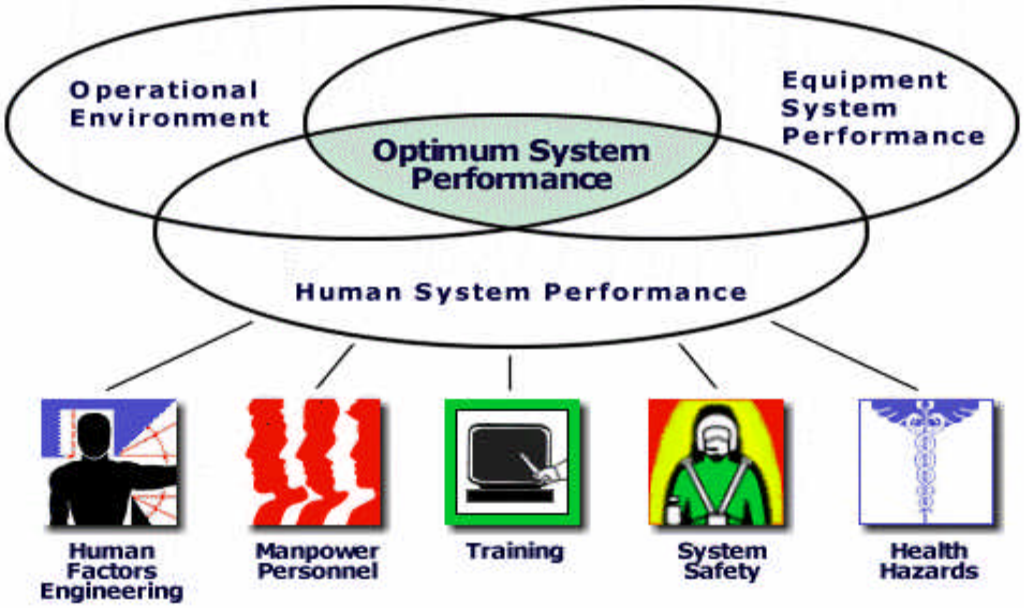
D-NET menu

HSI HOME

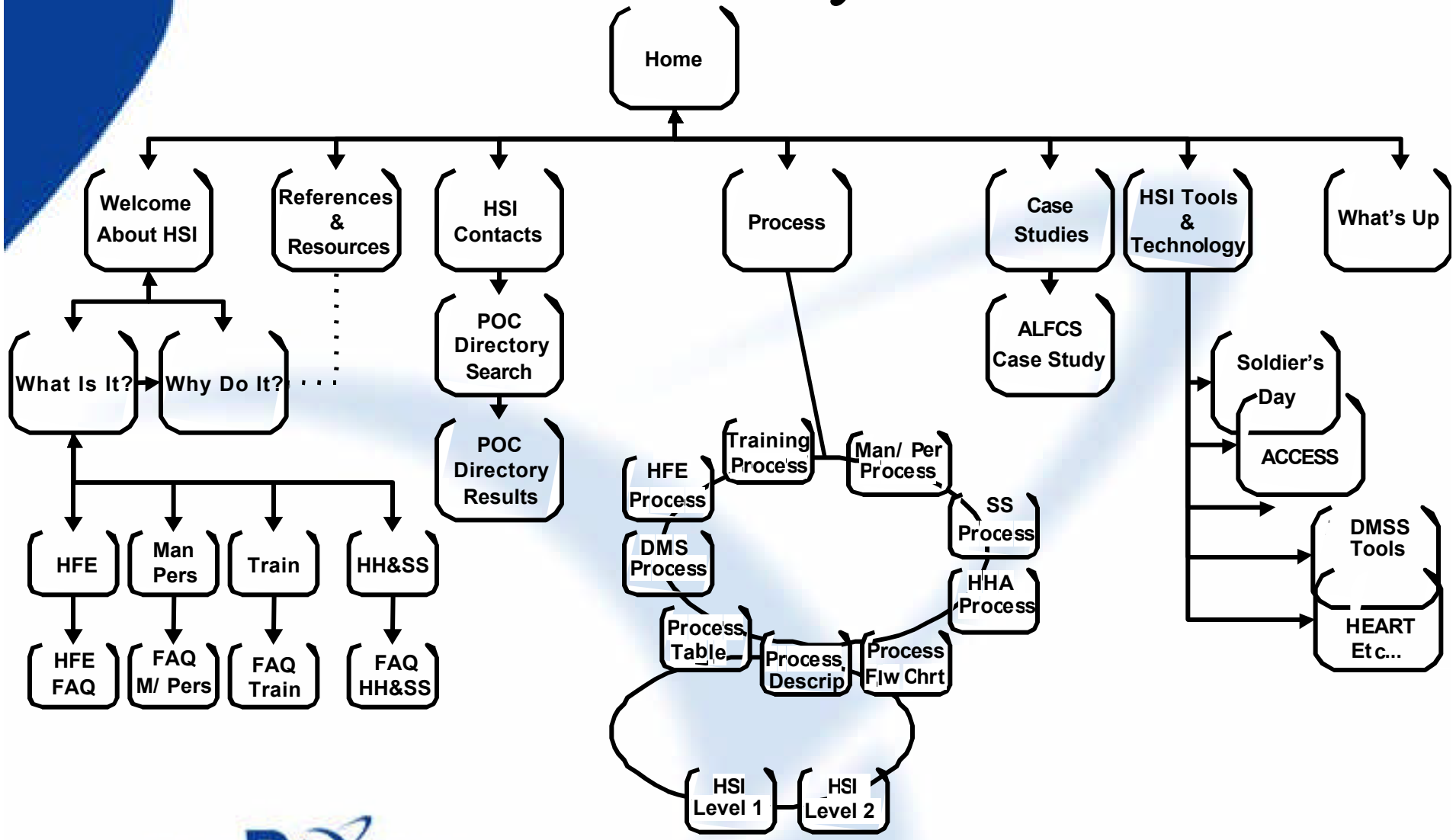
HSI



Human Systems Integration (HSI) is: "The technical process of integrating the five HSI domains, Human Factors Engineering,

Internet

HSI - Web Site May 2000



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HSI Process MUST:

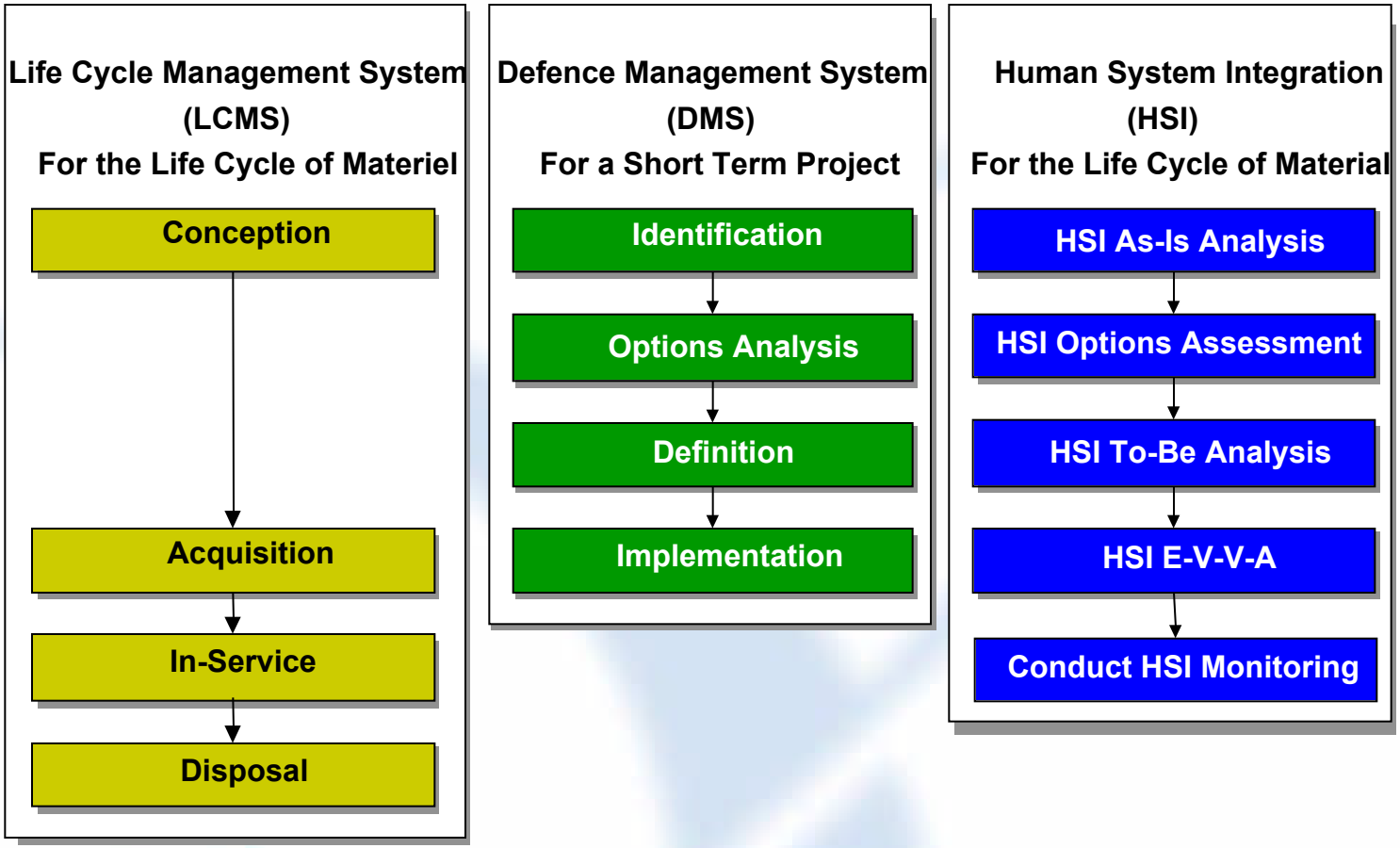
- Be simple
- be sequenced
- illustrate interrelationships and interdependencies
- map HSI with each domain
- map HSI with DMS
- accommodate developmental system vs COTS

HSI Process - Unique ?

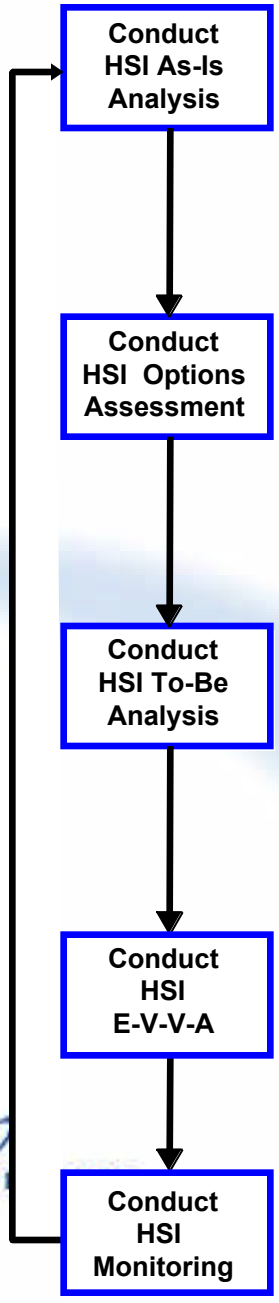
- Integration
  - **Integrated** processes of HSI domains
  - **Shared data repositories**

- Risk
  - an additional layer?
- Benefits
  - shared resources, shared data, re-use, common tool requirements

HSI Process


Life Cycle Management System
(LCMS)
For the Life Cycle of Materiel
Conception
Acquisition
In-Service
Disposal
Defence Management System
(DMS)
For a Short Term Project
Identification
Options Analysis
Definition
Implementation
Human System Integration
(HSI)
For the Life Cycle of Material
HSI As-Is Analysis
HSI Options Assessment
HSI To-Be Analysis
HSI E-V-V-A
Conduct HSI Monitoring

HSI Process



SS(ID)

SS(PPA)

SS(EPA)

Bid Evals

HSI Process

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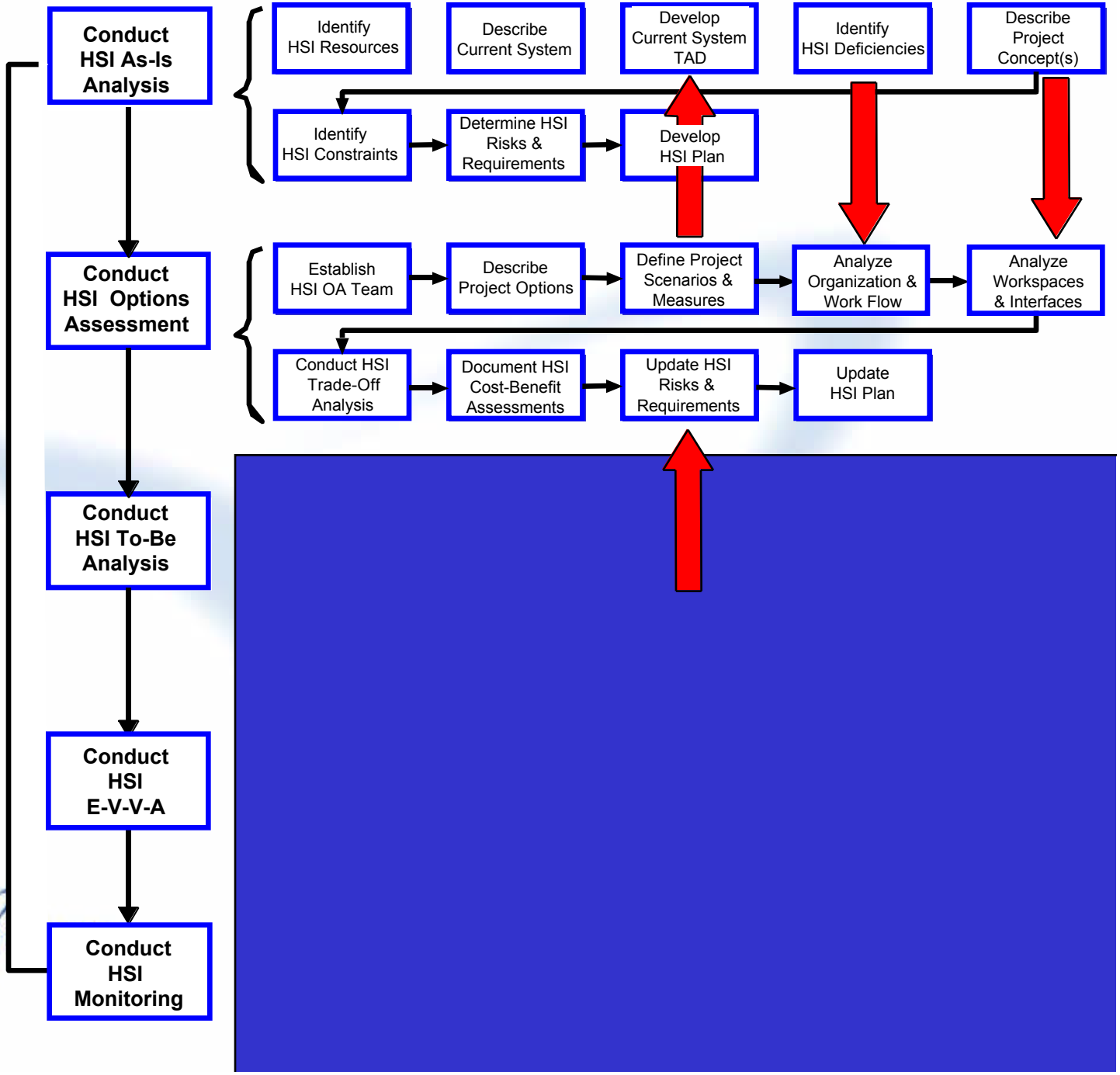
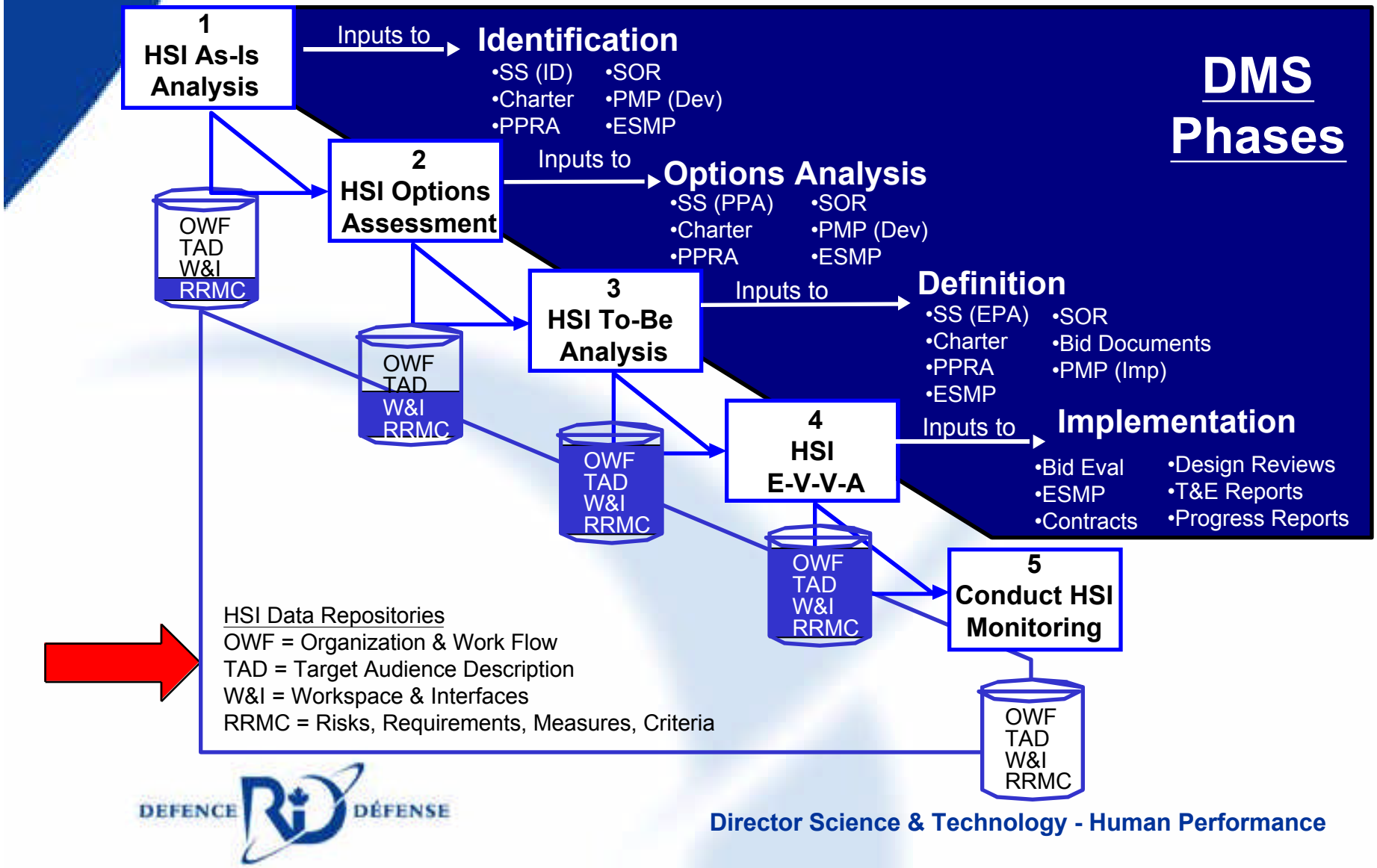

Conduct HSI As-Is Analysis
Identify HSI Resources
Describe Current System
Develop Current System TAD
Identify HSI Deficiencies
Describe Project Concept(s)
Identify HSI Constraints
Determine HSI Risks & Requirements
Develop HSI Plan
Conduct HSI Options Assessment
Establish HSI OA Team
Describe Project Options
Define Project Scenarios & Measures
Analyze Organization & Work Flow
Analyze Workspaces & Interfaces
Conduct HSI Trade-Off Analysis
Document HSI Cost-Benefit Assessments
Update HSI Risks & Requirements
Update HSI Plan
Conduct HSI To-Be Analysis
Conduct HSI E-V-V-A
Conduct HSI Monitoring

HSI Process - Data Repositories



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HSI Process - Domain Integration

DMS Process	HSI Process	HFE GO	Training GO
Identification	1.0 Conduct HSI As-Is Analysis 1.1 Identify HSI Resources 1.2 Describe Current System 1.3 Develop Current System TAD 1.4 Identify HSI Deficiencies 1.5 Describe Project	Lessons Learned and HFE Deficiencies Develop HFEPP	Needs Assessment (Preliminary) Concept for: Performance Analysis, Cause Analysis, Identify Solutions Training Analysis Concept for Training Analysis Concept for Training Design Cost Estimate

HSI Process - On HSI Web Site

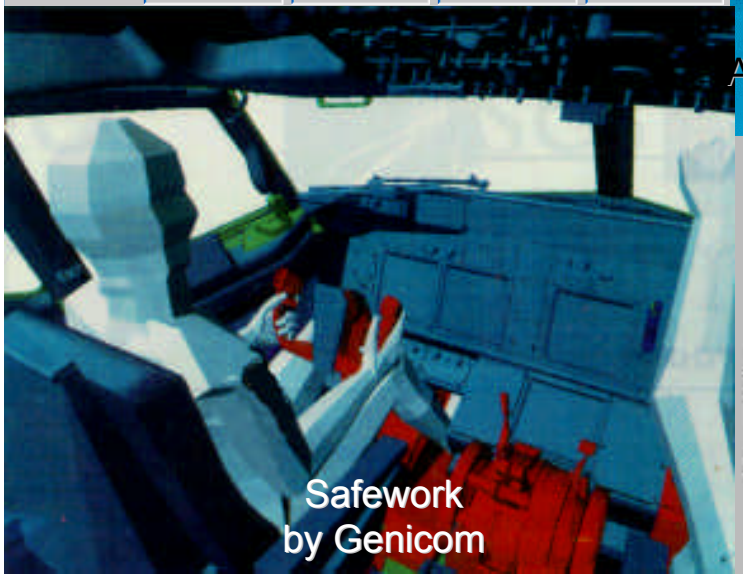
- Process Descriptions
- Process Flow Charts
- Process Domain Comparison Table
- Release on HSI Web Site for review and comment
  - use electronic means to invite review
- Link to ADM(Mat)'s DBCM "DND Acquisition Desktop" (Sept 2000)

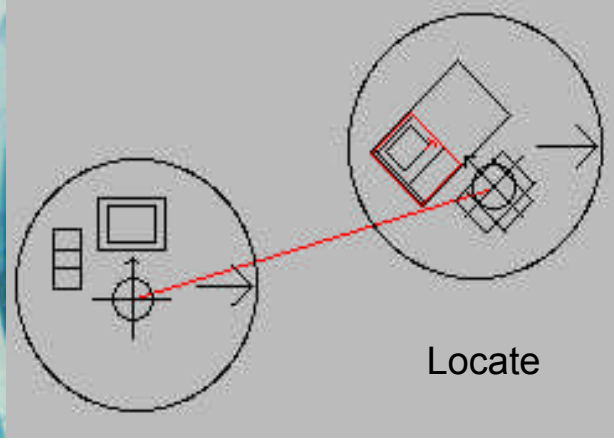
HSI - TOOLS

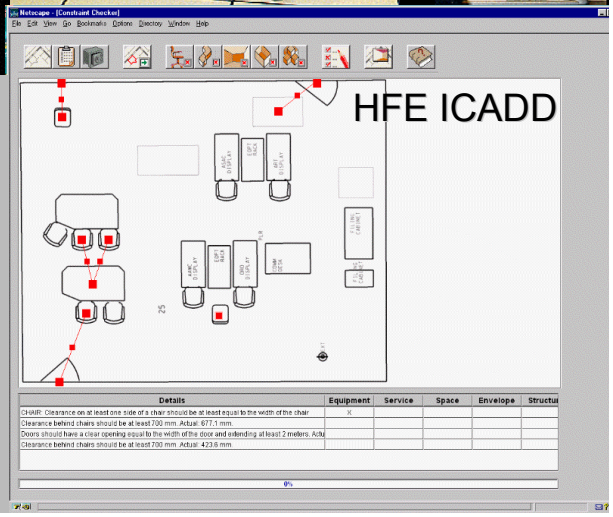
A Soldier's Day
File Edit Database Search Goto Notepad Help
Soldier's Day
Fragmentation Vest
Soldier Comments
While prone, the fragmentation vest can bunch up behind the neck.
Vest contact at the back of the helmet can tip the helmet brim forward into the soldier's line of sight.
Helmet clash with the sight could reduce target acquisition speed and shooting accuracy.
Associated
Equipment
Soldiers
Tasks
References
Human Factors
Item and Associated Equipment
Body Armour, Fragmentation Vest
Upper
50 Calibre Machine Gun, M2
Badge, Identification
Body Armour, Frag. Vest, Modified
Body Armour, Frag. Vest, Small Arms
C6 General Purpose Machine Gun
Data
Front View : Fragmentation Vest
Rear View : Fragmentation Vest
Body Armour, Fragmentation Vest
Human Factors Performance Requirer
Soldier Comments
Schematic Front View : Frag. Vest
Schematic Rear View : Frag. Vest
Jump To
Tree View
Equipment Menu
Main Menu

Aircraft Crewstation
Demonstrator

Safework VR
by Genicom


Safework
by Genicom


Locate


HFE ICADD

HSI PROGRAM - TOOLS

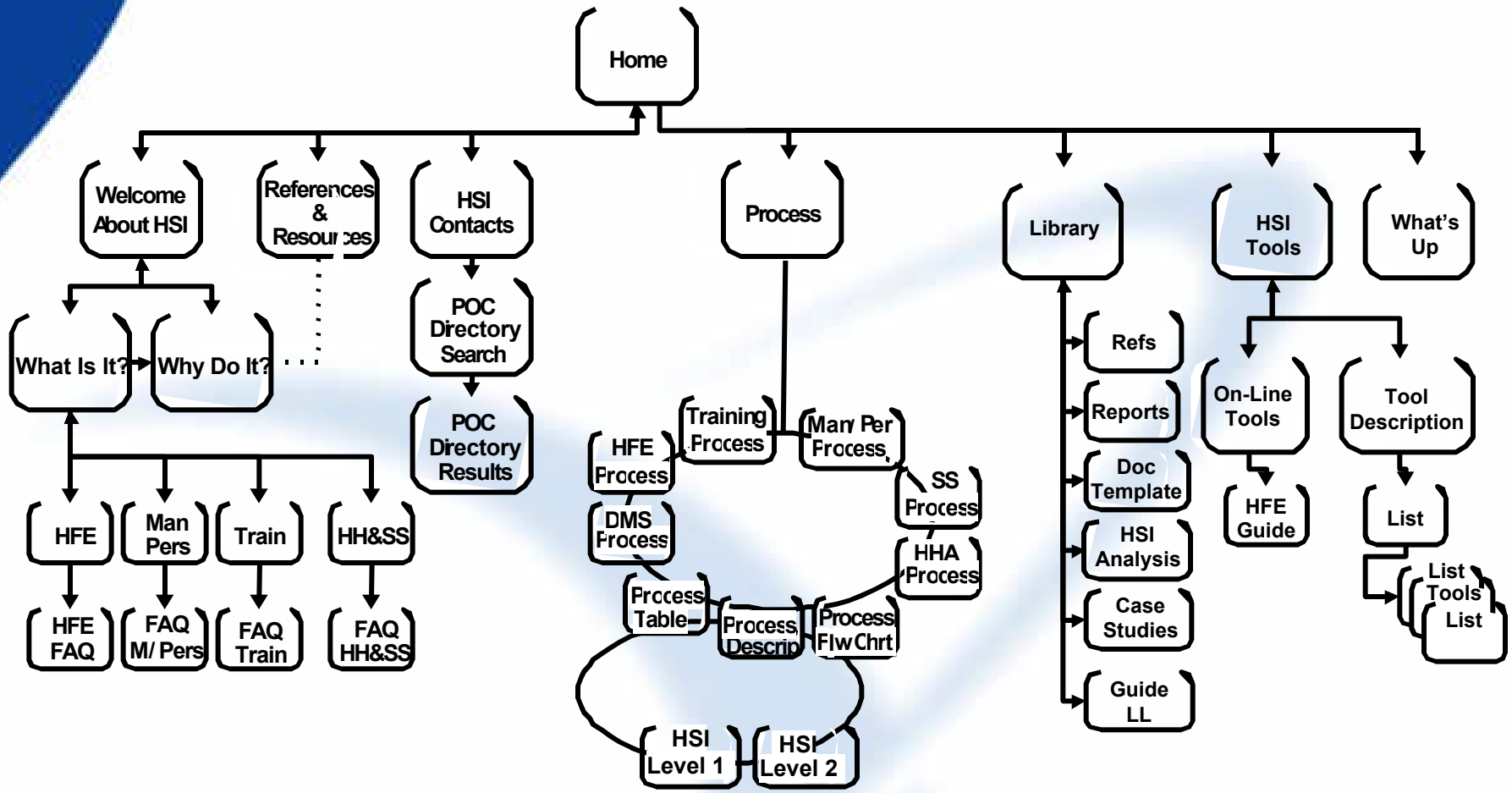
- Focus on Modeling and Simulation (M&S)
  - Re-usable workflow, workspace models
  - Re-configurable simulations
  - Libraries of analysis, measures, and criteria

- Integrated Tool Suite
  - Data output from one analysis, input to next analysis.
  - In line with SBA's "SMART" concept of use and re-use of M&S

Future Activities - 2000/2001

- HSI Team
  - finalize and translate registration tools
  - conduct registration
  - establish *e-Newsletter*
- HSI References/ Reports/ Templates/...
- Performance Measures
  - Develop Guidance document (brief)
  - Document case studies (MA&S)
  - Contribute to “Tech Demo Projects” (i.e.: US ACTD) interested in using HSI tools (IPME/Safework...)

HSI Tools - Web Site(s) Sept 2000



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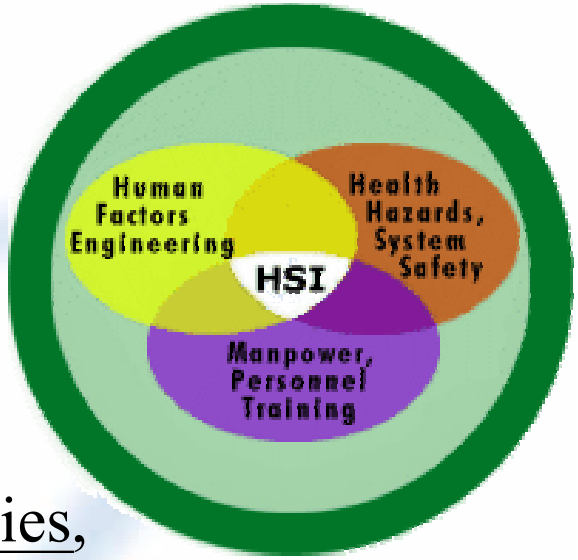
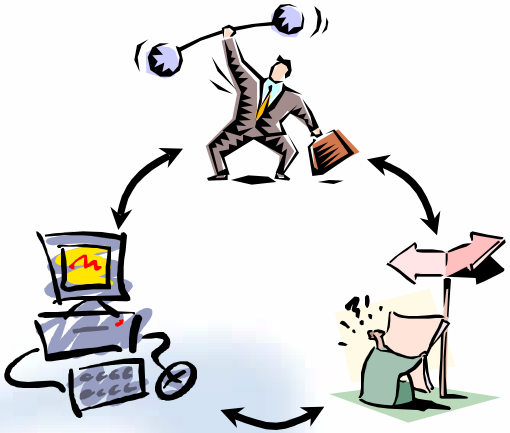
Summary: CANADIAN HSI Perspective

- A HSI Steering Board
- A Virtual Support team
- A documented HSI process.



- Enhanced HSI tools, techniques technologies, from R&D lab, focusing on M&S.
- Demonstration of the process and tools in actual Materiel Acquisition & Support projects (MA&S).
- A HSI Web site linking MA&S personnel

PEOPLE, PROCESS, TOOLS



Joint
HSI Rep

Industry
HSI Rep

Land
HSI Rep

VIRTUAL
HSI Support Team
- Provide Services
- Maintain Processes
- Maintain Tools, Web
- 2 way Links to R&D

Air
HSI Rep

Maritime
HSI Rep

OGD/ Domain
HSI Rep

Allies
HSI Rep

Materiel Acquisition & Support Projects

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HSI PROGRAM - COLLABORATION

- **Canadian HSI Program will be seeking collaborators.**
  - Seats on HSI Steering Board.
  - Share in HSI Process Development.
  - Share in HSI Tool Enhancements.
  - Share HSI Application Case Studies.
- **Collaborators will be sought from:**
  - International Defence Community
  - Other Government Departments (eg: Transport).
  - Canadian Industry (eg: Nuclear Power, Telecom.)

Defence R&D Canada

provides S&T leadership

in the advancement and

maintenance of Canada's

defence capabilities.

http://www.crad.dnd.ca